

United States Patent [19]
Black

[11] **Patent Number:** 4,835,621
[45] **Date of Patent:** May 30, 1989

[54] **GUN MOUNTED VIDEO CAMERA**

[76] **Inventor:** John W. Black, 5281 M-43,, Hickory
Corners, Mich. 49060

[21] **Appl. No.:** 116,499

[22] **Filed:** Nov. 4, 1987

[51] **Int. Cl.⁴** H04N 5/782

[52] **U.S. Cl.** 358/335; 358/906;
352/95; 354/82; 354/76; 354/293

[58] **Field of Search** 358/335, 906, 909, 209,
358/224; 354/81, 82, 76, 293; 352/95

[56] **References Cited**

U.S. PATENT DOCUMENTS

3,427,102	2/1969	Wade	352/95
3,545,356	12/1970	Nielsen	352/95 X
3,877,048	4/1975	Kellner	354/82 X
4,309,095	1/1982	Buckley	354/81
4,630,911	12/1986	Paul	352/95 X

FOREIGN PATENT DOCUMENTS

0079169 11/1919 Australia 352/95

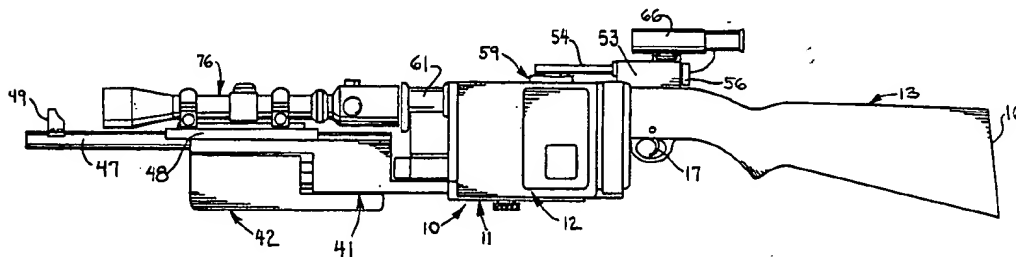
Primary Examiner—Robert L. Richardson

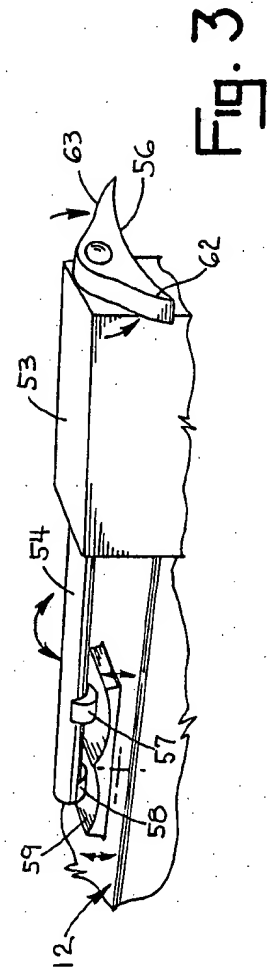
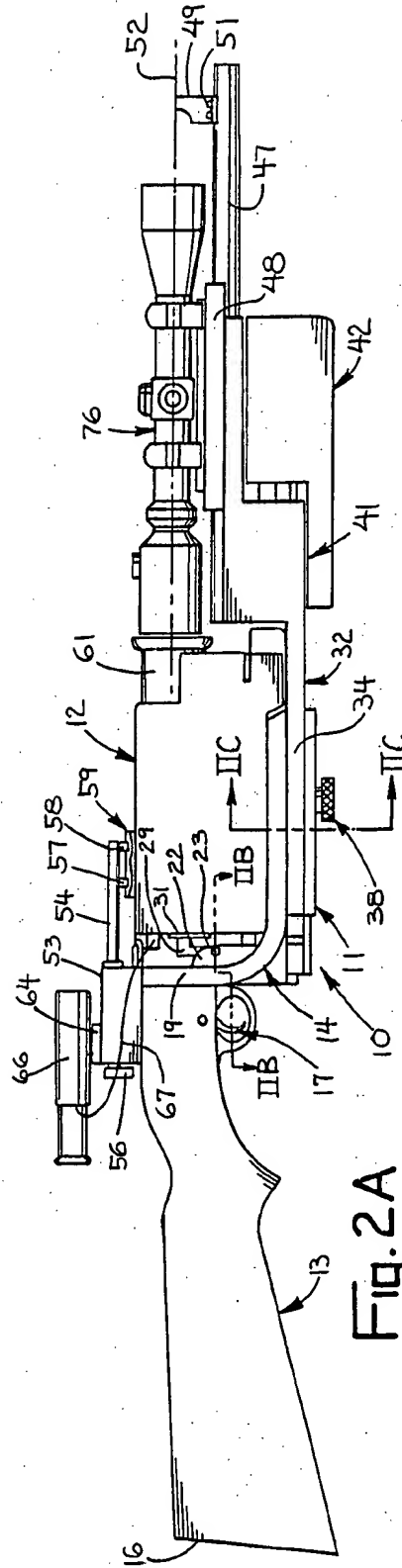
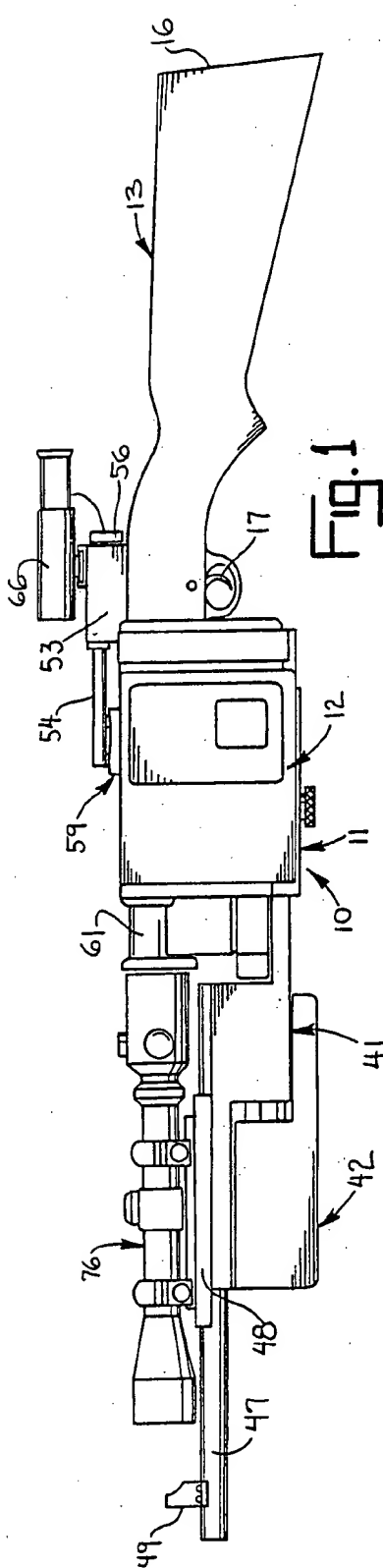
Attorney, Agent, or Firm—Flynn, Thiel, Boutell & Tanis

[57] **ABSTRACT**

A video camera recording device having a gunstock and a support structure for which includes a mounting platform adapted to receive thereon a hand held video camera recorder having a lense structure defining a line of sight, a recording medium for recording video information, and a viewfinder and mounting structure for mounting the viewfinder onto the gunstock. Structure is provided for effecting a sequential activating and deactivating of the video camera recording device for the purpose of starting a recording of video information onto the recording medium and stopping the recording, respectively. A gun sight is located in the line of sight so as to be visible through the viewfinder when the video camera recorder is recording video information on the recording medium. A trigger is provided on the gunstock and is adapted to be manually activated by a finger of a user's hand. A signal generator is provided which generates a signal visible through the viewfinder in response to the user activating the trigger. The signal is also simultaneously recorded on the recording medium.

20 Claims, 6 Drawing Sheets





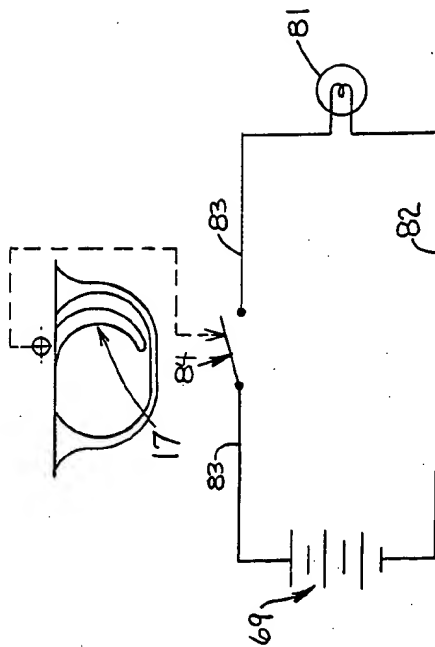


Fig. 10

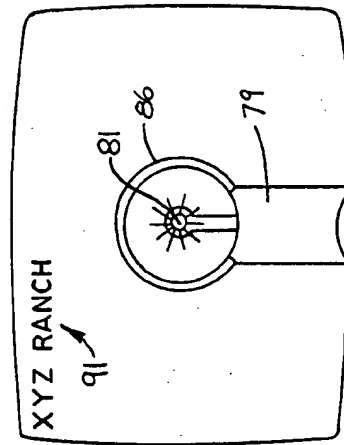


Fig. 11

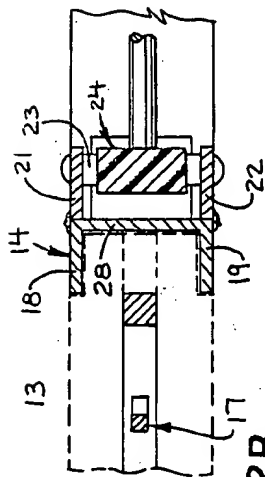


Fig. 2B

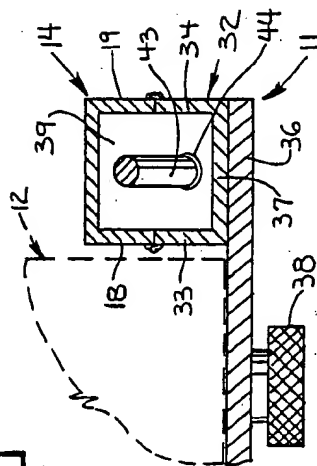
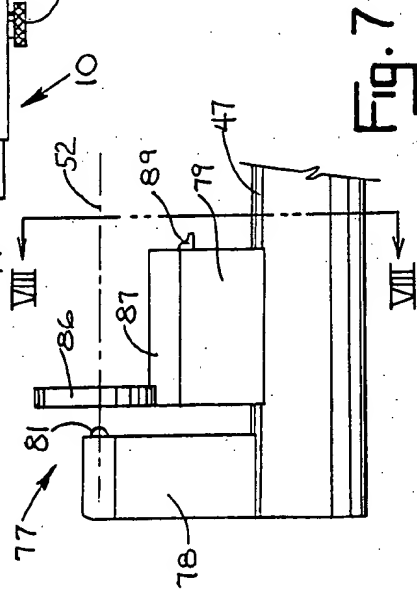
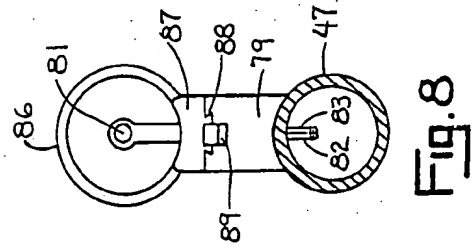
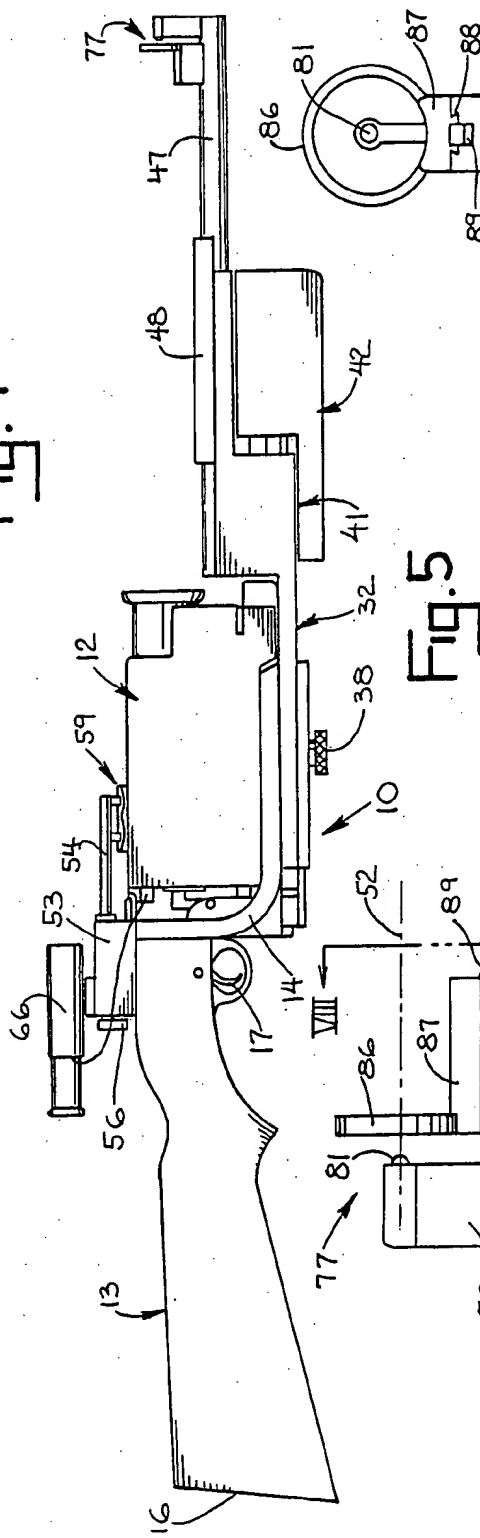
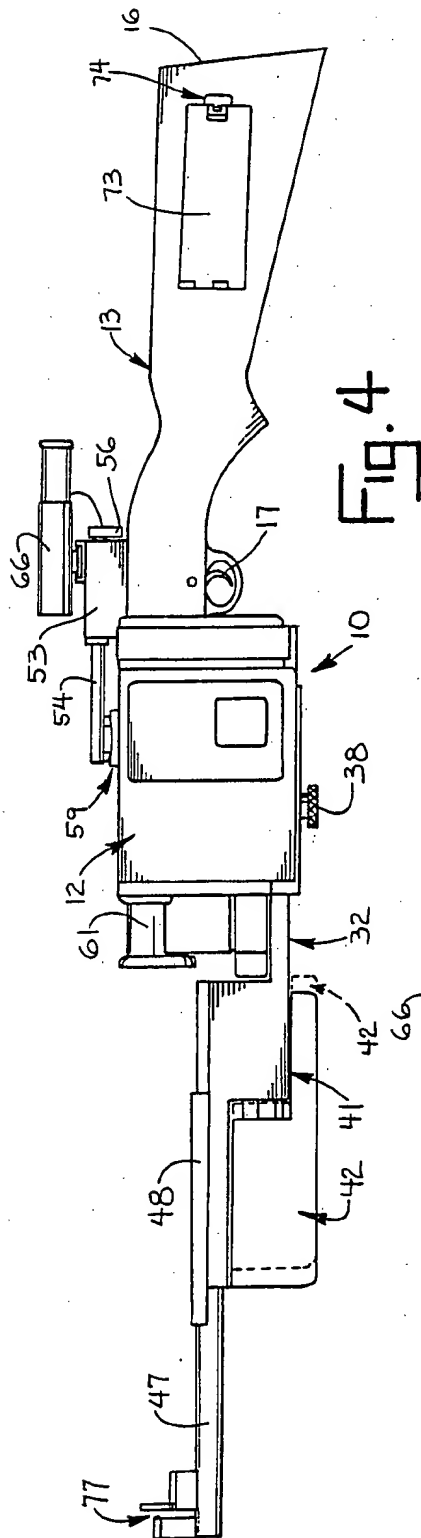
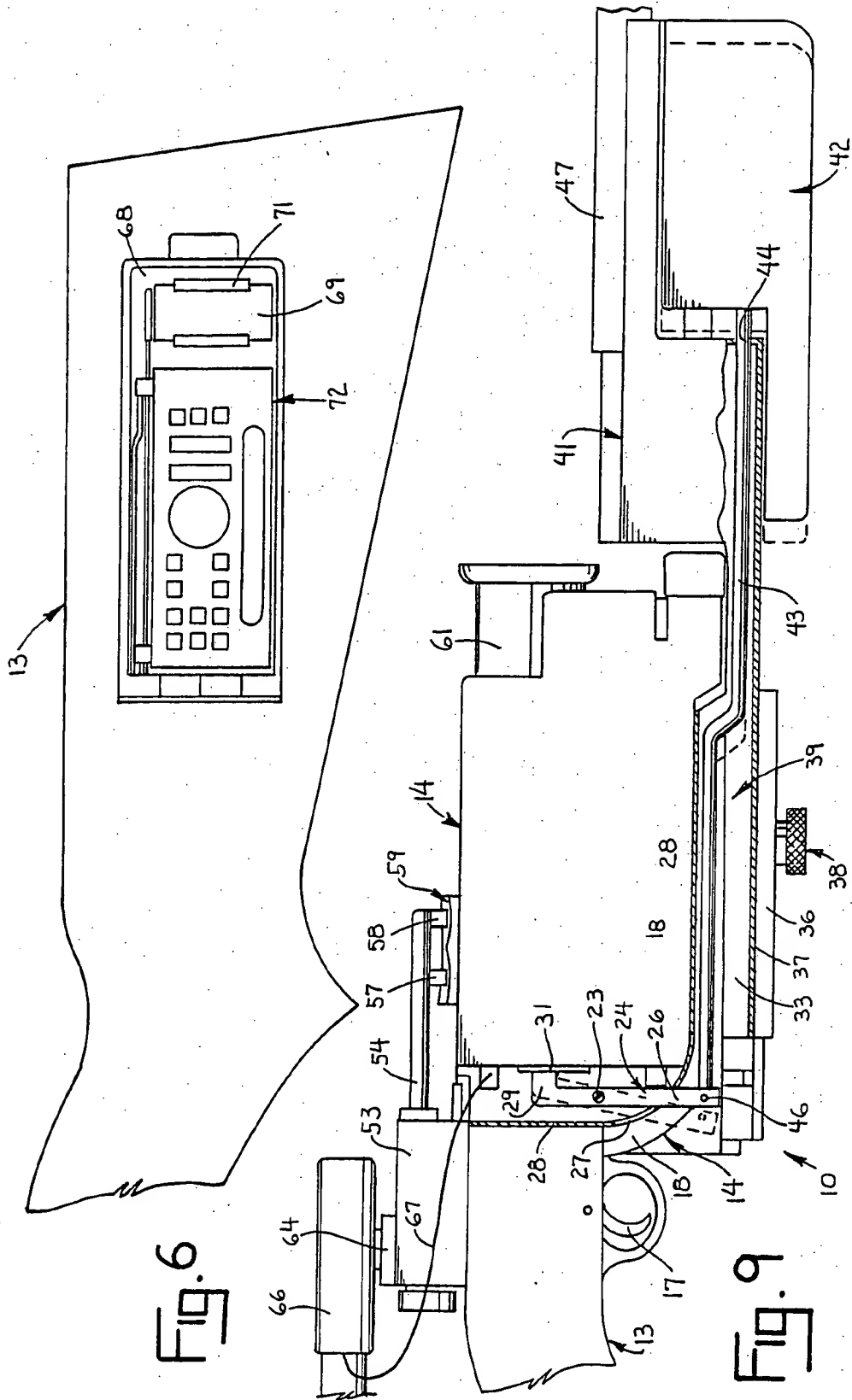
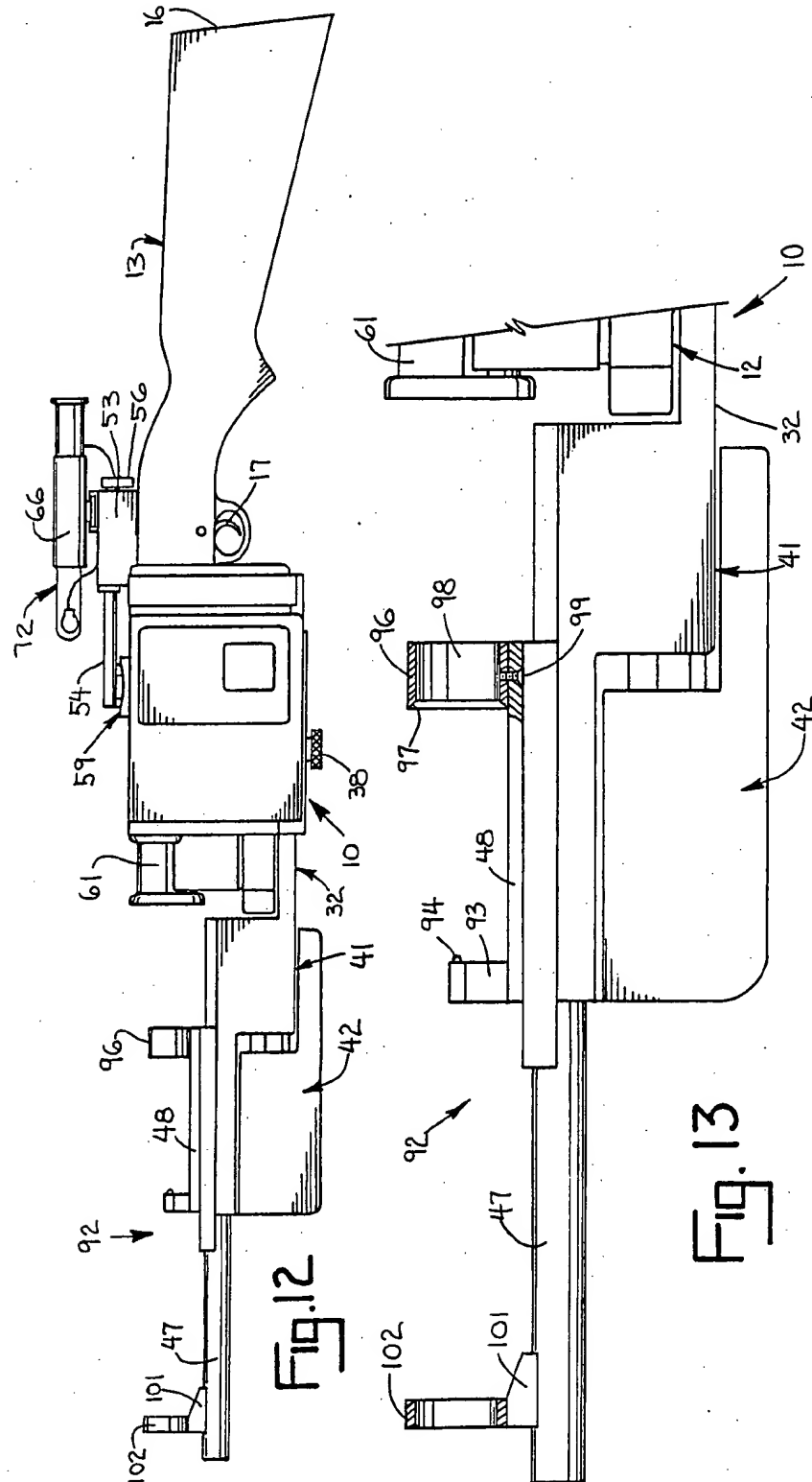
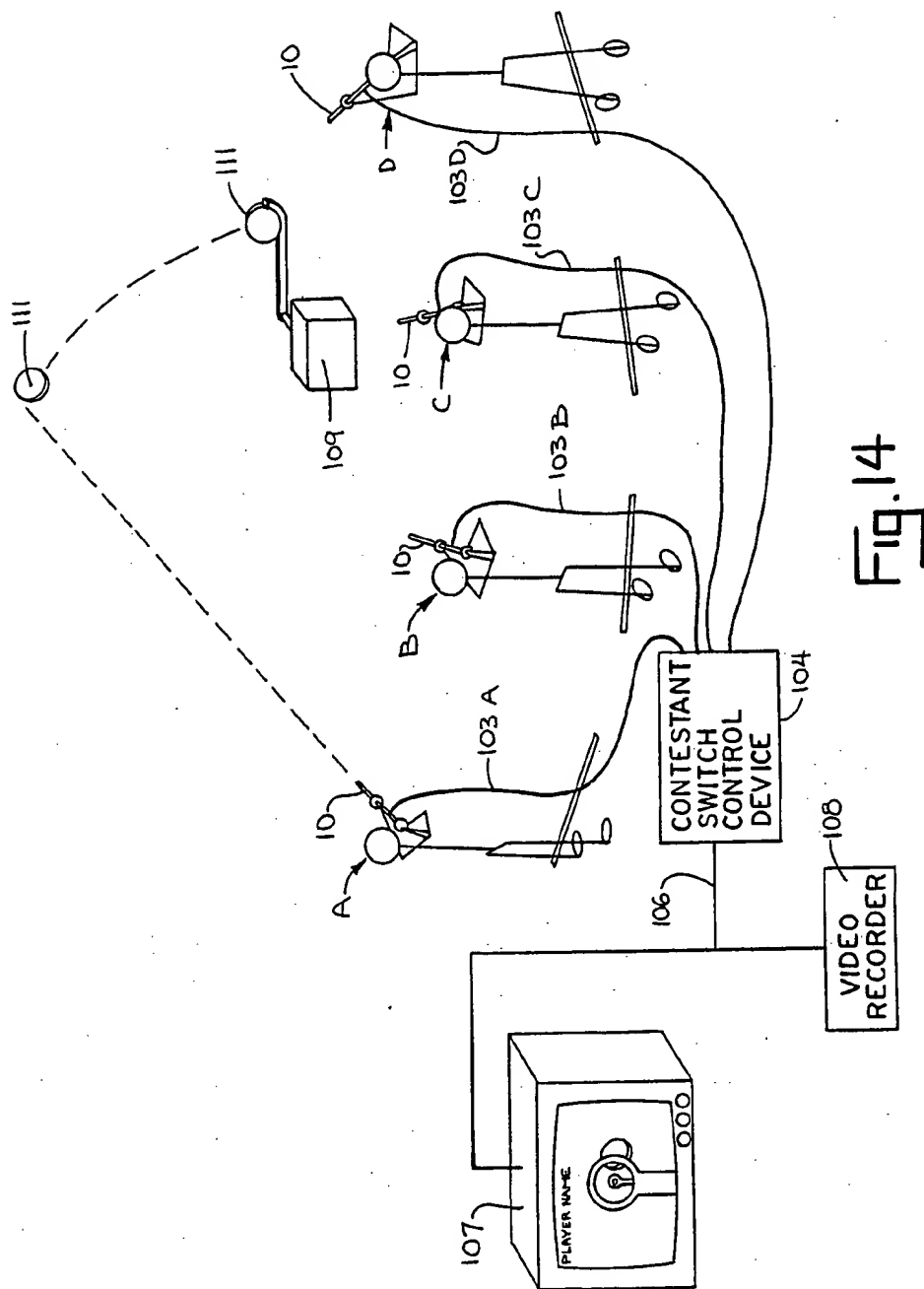


Fig. 2C









GUN MOUNTED VIDEO CAMERA

FIELD OF THE INVENTION

This invention relates to a video camera recording device and, more particularly, to a video camera recording device incorporated into a gun-like mounting structure which can be raised to the shoulder and sighted at an object in the same way that a gun is usually raised to the shoulder and aimed.

BACKGROUND OF THE INVENTION

Camera devices incorporated into gun-like structures are known. These structures facilitate a raising of the structure to the shoulder so that the camera can be sighted at an object in the same way that a gun is usually raised to the shoulder and aimed. Examples of these types of devices are shown in U.S. Pat. Nos. 624,693, 730,458, and 1,190,000. The cameras utilized in the aforementioned references are photographic cameras capable of taking "still" pictures. In U.S. Pat. No. 1,190,000, a rifle-like device having a pump mechanism thereon is provided, wherein the trigger is operatively connected to a shutter releasing device and the pump mechanism is connected with the film roll of the camera so that the roll is turned and the film wound thereon as the pump mechanism is moved longitudinally of the barrel. Further, the gun barrel is provided with a suitable sight and this registers with cross threads placed in the camera and the threads leave cross lines upon the film when the same is exposed and the point of intersecting of the lines indicates upon the picture the accuracy of aim exercised at the time that the film is exposed.

The popularity of video camera recording devices has been on the increase over the last several years. Heretofore, video camera recording devices have been quite large and have required the provision of a substantial battery pack to power the camera and effect a recording of information on the recording medium. Recently, however, the batteries have been miniaturized and a hand held video camera recorder capable of recording information on recording medium is now readily available.

This invention incorporates a conventional video camera recording device onto a structure resembling a rifle which can be raised to the shoulder and sighted at an object in the same way that a gun is usually raised to the shoulder and aimed.

Heretofore, it has not been possible for a spectator at a competitive shooting event to monitor "live" the shooting action along the line of sight observed by a participant. Accordingly, it is desirable to provide a device which will enable spectators to monitor the "live" shooting action along the line of sight observed by a contestant in a shooting contest or by playing a recording of the shooting action shortly after the event has occurred.

It is, therefore, a primary object of the invention to provide a video camera recording device mounted on a gun-like mounting structure which can be raised to the shoulder and sighted at an object in the same way that a gun is usually raised to the shoulder and aimed.

It is a further object of the invention to provide structure on the video camera recording device which generates a signal visible through the viewfinder of the video camera and, therefore, is recordable on the recording media so that the user can effect, following an activating of the video camera, an aiming of the line of

sight of the device at a target so as to bring the target into view through the viewfinder and to simultaneously record the target on the recording medium, aligning the target with the gun sight structure and the line of sight, activating a trigger to activate the signal generating device and to simultaneously record the signal on the recording medium thereafter followed by a deactivation of the video camera recorder device.

It is a further object of this invention to provide a gun sight in the form of a ring representing the spread of gun shot as the shot moves away from the end of the rifle, the signal generating structure becoming visible in the viewfinder the moment that the trigger is activated to indicate the moment in time that the user believes that the target will be struck by an imaginary projectile once the trigger is activated. All of this would be recorded on the recording media.

It is a further object of the invention to provide a video camera recording device, as aforesaid, which will enable hunters to stalk game and "shoot" same, namely, record the video imagery onto the recording medium for later playback and review by other members of the hunting party.

It is a further object of the invention to provide a video camera recording device, as aforesaid, for enabling spectators to watch "live" action along the line of sight observed by a participant in a competitive event, namely, an aiming of the video camera recording device at a stationary or moving target and noting the accuracy of the competitor by noting the moment in time that the competitor activates the trigger mechanism, the point in time of activation being indicated by video displayed information.

It is a further object of the invention to provide a video camera recording device, as aforesaid, wherein hunting lodges can provide its guests with video recording camera devices for purposes of "shooting" wild game on adjacent premises, each "shooting" event having the name of the lodge displayed on the video, thereby enabling the lodge to send video tape recordings to its prospective customers for the purpose of advertising the availability of wild game on premises adjacent the lodge.

It is a further object of the invention to provide a video camera recording device, as aforesaid, wherein a conventional lense adjusting feature is included on the video camera capable of zooming toward or zooming away from a given target, and wherein structure is provided for enabling operation of the lense structure with a single digit on the same hand of the user that activates the trigger, the structure being oriented so that the user can simultaneously engage the trigger and manipulate the lense structure on the video camera for purposes of zooming toward or away from a specified target.

It is a further object of the invention to provide a video camera recording device, as aforesaid, wherein a light is provided for illuminating the target.

SUMMARY OF THE INVENTION

The objects and purposes of the invention are met by the provision of a video camera recording device having a gunstock and a gun barrel with support structure being provided for interconnecting the gunstock to the gun barrel. The support structure includes a mounting platform adapted to receive thereon a hand held video camera recorder having a lense structure defining a line

of sight, a recording medium for recording video information, and a viewfinder and mounting structure for mounting the viewfinder onto the gunstock. Structure is provided for effecting a sequential activating and deactivating of the video camera recording device for the purpose of starting a recording of video information onto the recording medium and stopping the recording, respectively. A gun sight is located in the line of sight so as to be visible through the viewfinder and especially when the video camera recorder is recording video information on the recording medium. A trigger is provided on the gunstock and is adapted to be manually activated by a finger of a user's hand. A signal generator is provided which generates a signal visible through the viewfinder in response to the user activating the trigger. The signal is also simultaneously recorded on the recording medium. Thus, the user can effect an activating of the video camera recorder device, aiming the line of sight at a target so as to bring the target into view through the viewfinder and to simultaneously record the target on the recording medium, aligning the target with the gun sight and the line of sight, activating the trigger to activate the signal generator to provide a signal visible through the viewfinder and to simultaneously record the signal on the recording medium and, lastly, deactivate the video camera recorder device.

BRIEF DESCRIPTION OF THE DRAWINGS

Other objects and purposes of the invention will become apparent to those skilled in the art upon a reading of the specification with reference to the drawings described, in which:

FIG. 1 is a side elevational view of a video camera recording device embodying the invention;

FIG. 2A is a side view of the opposite side of the video camera recording device illustrated in FIG. 1;

FIG. 2B is a sectional view taken along the line II-B—II-B of FIG. 2A;

FIG. 2C is a sectional view taken along the line IIC—IIC of FIG. 2A;

FIG. 3 is an enlarged prospective view of a device for operating the telephoto lense on the video camera recording device;

FIG. 4 is a side view of a video camera recording device without a telephoto lense;

FIG. 5 is a side view of the opposite side of the video camera recording device illustrated in FIG. 4;

FIG. 6 is an enlarged side view of the gunstock illustrated in FIG. 4 and showing a compartment housing a character generator device enabling readable information to be displayed in the viewfinder and recorded on the recording media;

FIG. 7 is an enlarged side view of the end of the gun barrel illustrated in FIG. 4;

FIG. 8 is a sectional view taken along the line VIII—VIII of FIG. 7;

FIG. 9 is an enlarged fragment of the side view illustrated in FIG. 5, but with a portion of the structure being sectioned to reveal the structure for activating the video camera recording device;

FIG. 10 is an electrical schematic of a trigger activating signalling device;

FIG. 11 is a representative illustration of the view seen through a viewfinder, which view includes identification information provided by a character generator device and a signalling lamp indicative of an activation of the trigger;

FIG. 12 is a side view of a video camera recording device without a telephoto lense construction;

FIG. 13 is an enlarged side view of the gun sight illustrated in FIG. 12; and

FIG. 14 is a view illustrating a game having four contestants shooting at a target launched by a target launcher.

DETAILED DESCRIPTION

A video camera recording device 10 embodying my invention is illustrated in the drawings. The video camera recording device 10 includes a support structure 11 for supporting a video camera recorder 12, such as a model JUC GZ-SSU camera marketed by JVC, Victor Company of Japan, Ltd. An elongated gunstock 13 is connected to the support structure 11 by a bracket 14 which is bent to a L-shape (FIG. 2). The gunstock 13 has a shoulder engaging surface 16 at a rear end thereof remote from the end to which the bracket 14 is connected. In addition, the gunstock 13 has a trigger mechanism 17.

The bracket 14 has an inverted U-shaped cross section. The legs 18 and 19 (FIG. 2B) on one leg of the L-shaped bracket 14 are fastened to the front end of the gunstock 13. The legs 18 and 19 straddle the sides of the gunstock and are fastened by fastening structure not illustrated. A pair of laterally spaced plates 21 and 22 are fastened to the bracket 14 as shown in FIG. 2B and in FIG. 2A. The plates 21 and 22 are coplanar with the side plates 18 and 19 on the bracket 14 and support a pivot axle 23 therebetween. A two arm lever 24 is pivotally mounted on the axle 24 as best illustrated in FIG. 9. The arm 26 of the lever 24 extends through an opening 27 in the bight wall 28 of the U-shaped bracket 14. The arm 29 of the lever 24 has an enlargement thereon which engages an on/off button on the video camera recorder 14.

A U-shaped channel member 32 (FIGS. 1, 2A and 2C) has two laterally spaced upstanding legs 33 and 34 thereon which are aligned with and secured to the legs 18 and 19 on the bracket 14. A mounting plate 36 is secured to the bottom face of a bight wall 37 of the channel 32 and is cantilevered to one side thereof as illustrated in FIG. 2C. A knurled knob 38 attached to a screw (not illustrated) is provided on the mounting plate 36 and is utilized in a conventional manner to secure the video camera recorder 12 to the mounting plate 36. The connected inverted U-shaped bracket 14 and the U-shaped channel 32 define an internal passageway 39.

A guide structure 41 is secured to the forward end of the U-shaped channel 32. The guide structure 41 slidably supports a grip 42 for movement longitudinally of the U-shaped channel 32, namely, forwardly and backwardly. A rod 43 extends through an opening 44 in a front wall of the U-shaped channel 32 and is connected to the grip 42 in a conventional manner. Forward and rearward movement of the grip 42 will cause a forward and rearward movement of the rod 43. The rear end of the rod 43 is connected by a pivot pin 46 to an end of the lever arm 26 remote from the pivot axle 23. In other words, a rearward movement of the grip 42 to the broken line position in FIG. 9 will effect a clockwise pivoting of the lever 24 causing the enlargement on the arm 29 to push on the on/off button 31 on the video camera recorder 14 to turn the camera on, for example. A spring, not illustrated, can be utilized to effect a return of the grip 42 to the solid line position. A second rear-

ward movement of the grip 42 will cause the enlargement on the lever arm 29 to again push on the on/off button 31 on the video camera recorder 14 to turn the camera off, for example.

An elongated gun barrel 47 is secured to the guide structure 41 and extends forwardly therefrom. The gun barrel 47 is comprised of a hollow tubular piece of metal as shown, for example, in FIG. 8. In addition, and if desired, a further mounting plate 48 can be mounted on the guide structure 41 in a manner sandwiching the gun barrel 47 between the mounting plate 48 and the guide structure 41. The purpose for providing the mounting plate 48 will be explained in more detail below.

A gun sight 49 is mounted on the gun barrel 47 at the forwardmost end thereof. In this particular embodiment, a hinge 51 is provided to enable the gun sight 49 to be pivoted into and out of alignment with a line of sight 52 defined by the visual center of the optics in the video camera recorder.

A mounting block 53 is mounted on the forward end of the gunstock 13 on the upper side thereof. The mounting block 53 rotatably supports an elongated rod 54 therein, which rod has a two arm lever 56 secured to the rear end thereof. The forward end of the rod has a pair of cam pieces 57 and 58 thereon, which cam pieces are spaced axially along the length of the rod 54 and the high point of each cam piece is arcuately spaced from one another about the axis of the rod 54. The rod 54 extends above a teeter-totter switch 59 on the video camera recorder 12 which activates a servo mechanism inside the video camera recorder for varying the optics of a telephoto lens 61 between limits of adjustment thereof. The centrally viewed part of the optics of the telephoto lens 61 define, as stated above, the line of sight 52. Thus, a manual engagement by, for example, the thumb of the user, to either the arm 62 or the arm 63 of the lever 56 will cause a rotation of the rod 54 to bring either the cam piece 57 or the cam piece 58 into operable engagement with the teeter-totter switch 59 to activate the servo mechanism for altering the optics of the telephoto lens 61.

A pedestal 64 is provided on the upper surface of the mounting block 53 and includes structure for facilitating a mounting of a conventional viewfinder 66 which is coupled by a wire 67 to the video camera recorder 12. The viewfinder has a screen thereon for displaying video imagery developed by the video camera recorder.

A recess 68 is provided in the gunstock 13 as illustrated in FIG. 6. A conventional battery, such as a miniature nine volt battery, 69 is mounted in a battery holding bracket 71 inside the recess 68. In addition, a character generator 72, such as a model CG-P50, marketed by JVC, Victor Company of Japan, Ltd., is mounted in the recess 68. A hinged cover 73 (FIG. 4) is hingedly secured to the gunstock 13. A releasable catch mechanism 74 is provided to lock the cover 73 in a closed position. The purpose of the battery 69 and the character generator 72 will be explained in more detail below.

As shown in FIGS. 1 and 2A, a telephoto lens scope mechanism 76 is mounted on the mounting plate 48 so that the line of sight thereof is aligned with the line of sight 52 for the telephoto lens 61 on the video camera recorder 12. A use of the telescopic scope 76 is optional, as is clearly depicted by the arrangement illustrated in FIGS. 4, 5, 9, 12 and 13. However, the telephoto lens scope 76 has a set of crossed lines therein which assist the user of the video camera recording device in align-

ing the line of sight 52 with a designated target. The crossed lines are in alignment with the gun sight 49 provided on the end of the gun barrel 47. However, the hinge structure 51 allows the gun sight 49 to be pivoted out of the line of sight 52 so that only the crossed lines on the scope 76 can be utilized in aligning the line of sight 52 with the designated target.

In the arrangement illustrated in FIGS. 4, 5, 7 and 8, a modified gun sight 77 is provided on the end of the gun barrel 47. More specifically, a pair of axially spaced pedestals 78 and 79 are mounted on the upper surface of the gun barrel 47. A lamp 81 is mounted on the endmost pedestal 78, the central point of the lamp 81 being positioned on the line of sight 52, as shown in FIG. 7. Two wires 82 and 83 (FIG. 8) are connected to the lamp 81 and extend preferably through the barrel 47, the passageway 39 and a further set of passageways in the gunstock (not illustrated) to the recess 68. One of the wires, for example, the wire 83, is interrupted by an on/off switch 84 (FIG. 10). The ends of the wires 82 and 83 remote from the lamp 81 are connected to opposite ends of the battery 69 in the recess 68. When the user pulls the trigger 17 rearwardly, the switch 84 will be closed and the lamp 81 will become illuminated, as schematically shown by the broken line representation in FIG. 10.

A ring 86 is mounted onto a base 87. The base 87 is connected by means of a dove-tail slide arrangement 88 to the upper surface of the pedestal 79 oriented rearwardly from the pedestal 78 as illustrated in FIGS. 7 and 8. The center point of the ring 86 is coincident with the line of sight 52. A latch 89 is provided for locking the base 87 to the pedestal 79. Thus, upon activation of the video camera recorder 12, the view as seen through the viewfinder 66 is represented in FIG. 11. A target can be aligned with the line of sight indicated by the lamp 81 oriented in the central portion of the ring 86. Once the target is inside the ring 86 and aligned with the line of sight 52 or the center of the lamp 81, the user can pull the trigger to cause the lamp 81 to become illuminated. The character generator 72 mentioned above will cause designated and desired indicia 91 to also appear on the screen of the viewfinder 66 either continuously or in response to an activation of the trigger 17.

Another gun sight arrangement 92 is illustrated in FIGS. 12 and 13. In this particular embodiment, a pedestal 93 is mounted on the mounting plate 48 and has a lamp 94 thereon. Intermediate the lamp 94 and the telephoto lens 61 on the video camera recorder 12 there is provided a hollow cylindrical ring 96 having a beveled reflective surface 97 on the end thereof facing the lamp 97. When the lamp 94 becomes illuminated, light rays will be reflected off from the beveled surface 97 onto the internal surface 98 of the ring 96. The reflected light on the interior surface 98 of the ring 96 will be visible on the screen of the viewfinder 66 as a halo around the lamp as seen through the viewfinder represented in FIG. 11. In this particular embodiment, the cylindrical ring 96 is secured by a screw 99 to the mounting plate 48.

The gun sight 9 includes a further pedestal oriented at the forward end of the gun barrel 47 and on which is mounted a hollow cylindrical ring 102. The center point of the ring 96 and the ring 102 are both coincident with the line of sight 52 and the center point of the lamp 94.

A still further gun sight embodiment includes the provision of a set of crossed lines permanently etched on the viewfinder screen, such as depicted by the bro-

ken lines 112 and 113 in FIG. 11. In the alternative, a character or line generator 114 (see broken line representation in FIG. 6) can be utilized in electronically generating the set of crossed lines on the viewfinder screen and capable of being recorded on the recording medium.

A light source 116 can be provided in the free end of the gun barrel 47 (FIG. 1). A battery therefor is provided in the compartment 68 or another compartment in the gun stock not shown. The battery is of a sufficient capacity to provide several hours of bright light for purposes of illuminating targets during the night hours. A switch (not shown) for controlling the on/off setting for the light source can be provided on the gunstock within easy reach of the fingers or thumb of the user. The wires (not shown) for delivering electrical energy from the battery to the light source 116 can extend through an appropriate passage in the gunstock and through the central opening in the gun barrel.

OPERATION

While the operation of the video camera recording device 10 described above will be apparent to those of ordinary skill in the art, a brief discussion of the operation will be provided for convenience.

Normally, nothing is visible on the screen of the viewfinder as long as the video camera recorder 12 is off. Thus, when it is desired to record information on a recording medium inside the video camera recorder 12, such as a tape cassette, it is necessary to turn the video camera recorder on. This is accomplished by moving the grip 42 rearwardly so that the rod 43 will cause the lever 24 to pivot clockwise to bring the enlargement on the arm 29 into engagement with the on/off button 31 on the video camera recorder 12 to turn the camera on. Once the camera is turned on, a view will appear on the screen of the viewfinder 66, which view is along the line of sight 52 of the telephoto lense 61 on the video camera recorder 12. Once a target is brought into view on the screen of the viewfinder 66, and is further aligned with the line of sight 52, the user may then pull the trigger. This will indicate the moment in time that the user desires to "shoot" at the target. If the target is on the line of sight, the accuracy of the user's shot will be visible on the screen of the viewfinder as well as recorded on the recording medium inside the video camera recorder 12. In the embodiment illustrated in FIGS. 3, 4 and 6, the character generator 72 may cause designated indicia 91 (FIG. 1) to appear on the screen of the viewfinder 66. If desired, the indicia 91 can be controlled to appear on the screen of the viewfinder in response to an activation of the trigger 17.

In the embodiment wherein a lamp on the line of sight is utilized, which lamp becomes illuminated when the user pulls the trigger 17, the lamp will become illuminated as indicated in FIG. 11. If the target is within the ring 86, illumination of the light 81 will indicate the moment in time that the user believes that the target will be hit if an imaginary gunshot were fired from an actual rifle. The recording medium inside the video camera recorder will record this moment in time and can be critiqued at a later moment in time following the shooting event. In this embodiment, the character generator 72 could be controlled to provide the indicia 91 either continuously or in response to an activation of the trigger 17.

Referring now to FIG. 14, a competitive event can take place with each contestant A, B, C and D having a

video camera recording device 10 in his or her possession. The video camera recording device in the hands of contestant A is connected by a wire 103A to a contestant control switch 104. Similarly, the video camera recorder on each of the video camera recording devices 10 in the hands of contestants B, C and D are connected by wires 103B, 103C and 103D, respectively, to the aforesaid contestant switch control device 104. The video signal from each of the video camera recorders is transmitted through the wires 103A to 103D through the contestant switch control device to a wire 106 to the video signal input terminals of a conventional television set 107. The wire 106 can also be connected to the video input terminals of a conventional video recorder 108. Further, the character generator 72 on each of the contestant's video camera recording device will be programmed to present on the screen of the respective viewfinder and the screen of the television set 104 the name of the player. If contestant A is to be the first to "shoot" at a target, the contestant switch control device 104 will be switched so that video signals will be transmitted through the wires 103A and 106 to both the television set 107 and the video recorder 108. Thereafter, the target launcher 109 will launch a target 111 and contestant A will aim his or her video camera recording device 10 at the target 111 so launched. Once the contestant A believes that it is time to shoot at the target 111, the trigger can be pulled and, at that moment in time, a lamp 81 will be illuminated to indicate the timing of the contestants shooting at the target. Thus, an audience can view the screen of the television set 107 and note the accuracy of the shot. Thereafter, each of contestants B, C and D will perform the same task and the results of their respective shots will be viewed on the screen of the television set and recorded on the video recorder 108. The results of each contestant's shooting can be later examined by a panel of judges and the contestant having the most accurate shots will be awarded the victor's prize.

Although particular preferred embodiments of the invention have been disclosed in detail for illustrative purposes, it will be recognized that variations or modifications of the disclosed apparatus, including the rearrangement of parts, lie within the scope of the present invention.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A video camera recording device, comprising:
 - means defining an elongated gunstock;
 - means defining a mounting platform adapted to receive thereon a hand-held video camera recorder means having a lense structure thereon defining a line of sight, a recording medium for recording video information, and a viewfinder;
 - support means for interconnecting said gunstock to said mounting platform means;
 - switch means for effecting a sequential activating and deactivating of said video camera recorder means for the purpose of starting a recording of video information on said recording medium and stopping the recording, respectively;
 - gun sight means located in said line of sight so as to be visible through said viewfinder when said video camera recorder means is recording video information on said recording medium;

means defining a trigger on said gunstock adapted to be manually activated by a finger of a user's hand; and

means for generating a signal visible through said viewfinder in response to the user activating said trigger, said signal also being simultaneously recorded on said recording medium so that the user can effect an activating of said video camera recorder means by operation of said switch means, by aiming said line of sight at a target so as to bring said target into view through said viewfinder and to simultaneously record said target on said recording medium, by aligning said target with said gun sight means and said line of sight, by activating said trigger to activate said means for generating a signal visible through said viewfinder and to simultaneously record said signal on said recording medium, and by operation of said switch means again to deactivate said video camera recorder means.

2. A video camera recording device according to claim 1, wherein said means for generating a signal includes an electric lamp and electric circuit means for effecting an illumination of said lamp in response to an activating of said trigger.

3. A video camera recording device according to claim 2, wherein said lamp is embodied in said gun sight means and is located on said line of sight.

4. A video camera recording device according to claim 3, including an elongated gun barrel extending from said mounting plate means, wherein said gun sight means includes a pedestal means mounted on said gun barrel, and an annular ring mounted on said pedestal means, said annular ring defining a generally circular opening the center of which lies on said line of sight, said lamp being located in the center of said annular ring when viewed through said viewfinder.

5. A video camera recording device according to claim 4, wherein said annular ring is defined by an elongated cylinder having a finite wall thickness, a radially inner edge at an end of said cylinder remote from said video camera recorder means being beveled to define a reflective surface for reflecting light from said lamp onto said interior surface of said cylinder so that a ring of reflected light will be visible through said viewfinder, said line of sight being congruent with a central axis of said cylinder.

6. A video camera recording device according to claim 5, wherein said gun sight means includes a further pedestal means located adjacent an end of said gun barrel remote from said gunstock, and a further annular ring mounted on said further pedestal and oriented so that a circular opening thereof has its center lying on said line of sight.

7. A video camera recording device according to claim 6, wherein said annular ring and said further annular ring have the same internal diameter.

8. A video camera recording device according to claim 1, wherein said means for generating a signal includes a character generator means for presenting to said viewfinder a title or other indicia.

9. A video camera recording device according to claim 8, including an elongated gun barrel extending from said mounting plate means, wherein said means for generating a signal also includes an electric lamp and electric circuit means for effecting illumination of said lamp in response to an activating of said trigger, said lamp being oriented on said gun barrel on said line of sight.

10. A video camera recording device according to claim 9, wherein said gunstock includes means defining

a compartment therein and a removable cover providing access to said compartment; and

wherein said character generator means and at least a portion of said electric circuit means are housed in said compartment.

11. A video camera recording device according to claim 1, wherein said video camera recorder means includes first manually operable means for varying the optics of a telephoto lense means between limits of adjustment thereof, said optics of said telephoto lense means being oriented in alignment with said line of sight; and

wherein a second manually operable means is mounted on said gunstock within reach of a hand of the user to facilitate the simultaneous engagement of said trigger and said second manually operable means by the fore finger and thumb, respectively, of the aforesaid user's hand.

12. A video camera recording device according to claim 11, wherein said means for generating a signal includes an electric lamp and electric circuit means for effecting an illumination of said lamp in response to an activating of said trigger.

13. A video camera recording device according to claim 12, wherein said lamp is embodied in said gun sight means and is located on said line of sight.

14. A video camera recording device according to claim 13, including an elongated gun barrel extending from said mounting plate means, wherein said gun sight means includes a pedestal means mounted on said gun barrel, and an annular ring mounted on said pedestal means, said annular ring defining a generally circular opening the center of which lies on said line of sight, said lamp being located in the center of said annular ring when viewed through said viewfinder.

15. A video camera recording device according to claim 11, wherein said mounting means also provides a connection of said second manually operable means to said gunstock.

16. A video camera recording device according to claim 1, wherein a plurality of said video camera recording devices are provided, each operable by a separate contestant in a contest;

wherein said video camera recorder means on each video camera recording device held by each contestant includes means for transmitting a signal from each contestant's video camera recording device to at least a video recording means.

17. The video camera recording device according to claim 16, wherein said video recording means includes a television set facilitating a simultaneous viewing of a contestant's use of said video camera recording device.

18. The video camera recording device according to claim 17, wherein said video recording means further includes a contestant switch control device for facilitating the transmission of only a single contestant at a time to said video recording means and said television set.

19. The video camera recording device according to claim 1, including an elongated gun barrel extending from said mounting plate means, wherein said switch means is provided on said gun barrel and includes means defining a reciprocal slide and connecting means for effecting an activating and deactivating of said video camera recorder means in response to a reciprocating of said reciprocal slide.

20. The video camera recording device according to claim 1, including an elongated gun barrel extending from said mounting plate means, and including an electric lamp means mounted adjacent a free end of said barrel for illuminating a target.

* * * * *



US006539661B2

(12) **United States Patent**
Hope

(10) **Patent No.:** **US 6,539,661 B2**
(45) **Date of Patent:** **Apr. 1, 2003**

(54) **OPTICAL IMAGING DEVICE FOR FIREARM SCOPE ATTACHMENT**

(76) **Inventor:** **Richard W. Hope**, 1508 Kline St.,
Denham Springs, LA (US) 70726

(*) **Notice:** Subject to any disclaimer, the term of this
patent is extended or adjusted under 35
U.S.C. 154(b) by 0 days.

(21) **Appl. No.:** **09/757,481**

(22) **Filed:** **Jan. 11, 2001**

(65) **Prior Publication Data**

US 2002/0002788 A1 Jan. 10, 2002

Related U.S. Application Data

(60) Provisional application No. 60/176,026, filed on Jan. 14,
2000.

(51) **Int. Cl.⁷** **F41G 1/38**

(52) **U.S. Cl.** **42/119; 89/41.05; 89/41.17**

(58) **Field of Search** **42/119, 120, 131;**
89/41.05, 41.17

(56) **References Cited**

U.S. PATENT DOCUMENTS

3,545,356 A * 12/1970 Nielsen 42/119
3,785,261 A * 1/1974 Ganteaume 95/12
4,290,219 A * 9/1981 Boller et al. 354/76
4,370,914 A * 2/1983 Voles 89/41.05
4,835,621 A * 5/1989 Black 358/335
5,020,262 A * 6/1991 Pena 42/106
5,054,225 A * 10/1991 Giuffre et al. 42/101

D332,457 S 1/1993 Zepp D16/132
5,287,644 A 2/1994 Bolduc 42/106
5,711,104 A 1/1998 Schmitz 42/100
5,887,375 A 3/1999 Watson 42/106
5,932,872 A 8/1999 Price 345/6
5,937,562 A * 8/1999 Brough 42/103
5,938,717 A 8/1999 Dunne et al. 340/937

FOREIGN PATENT DOCUMENTS

GB 2248287 4/1992

* cited by examiner

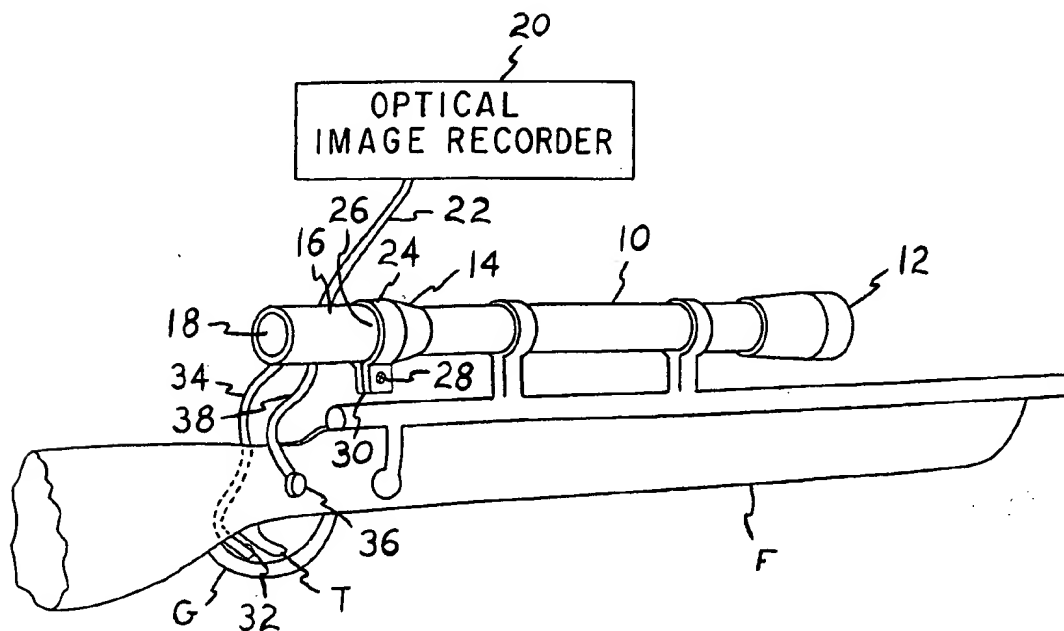
Primary Examiner—Stephen M. Johnson

(74) *Attorney, Agent, or Firm*—Richard C. Litman

(57) **ABSTRACT**

The present optical imaging device comprises an electro-optical recording device, such as a digital still camera, videotape recorder, etc, physically and optically connected to the scope sight of a firearm. The scope may be provided with a half silvered mirror at the eyepiece, which reflects a portion of the image passing through the scope to the axially offset recording device. The user of the firearm and optical system may thus continue to view the image through the scope. Other embodiments provide a small, light weight micro camera fitted to the scope eyepiece, with the camera receiving the image from the eyepiece and providing that image to the user through a rearward viewing screen. A switch may be provided to operate the system upon trigger actuation, or independently of the firearm trigger. The system is particularly valuable in sighting in a weapon or harmlessly capturing an image of an animal.

6 Claims, 4 Drawing Sheets



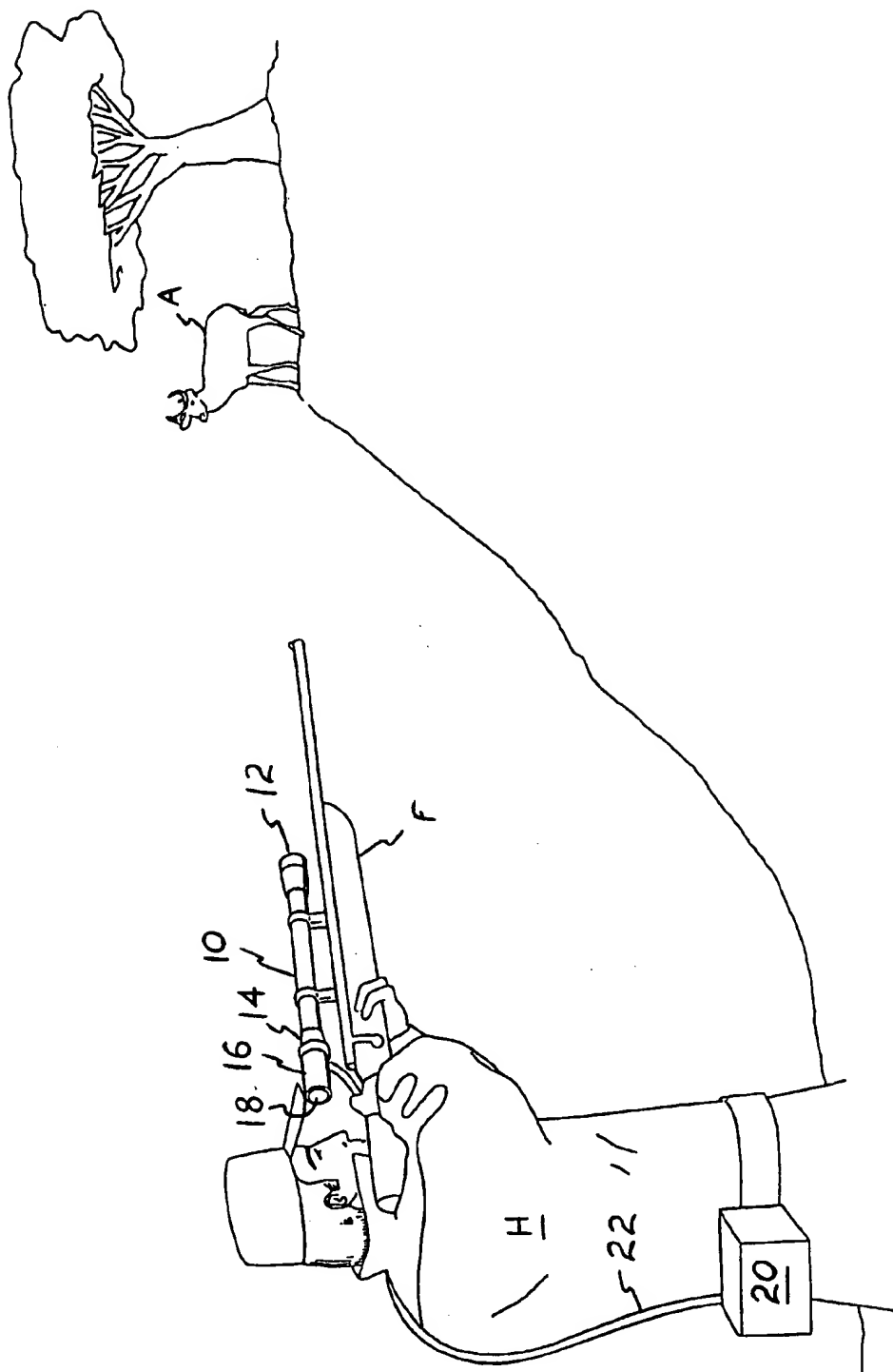


FIG. 1

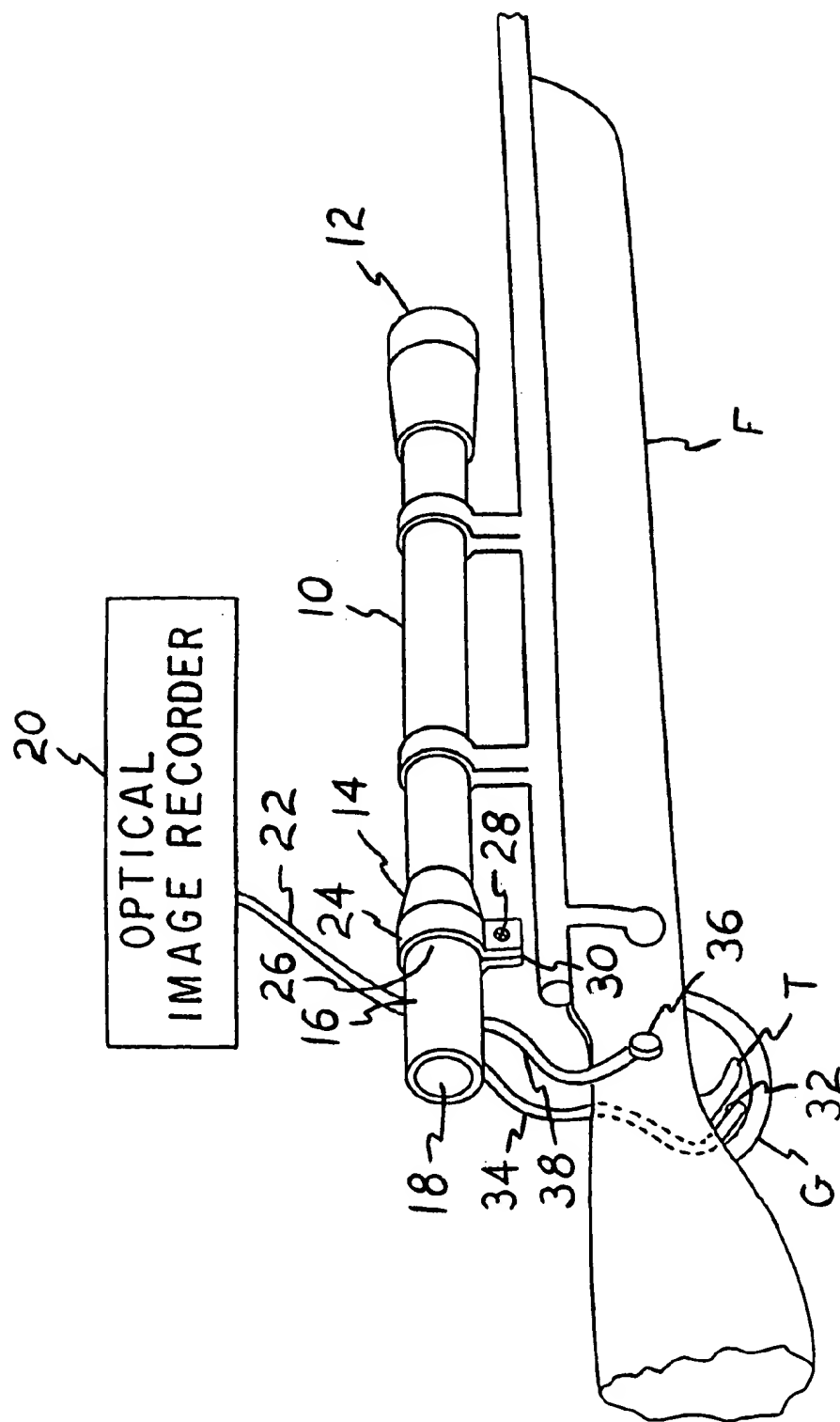


FIG. 2

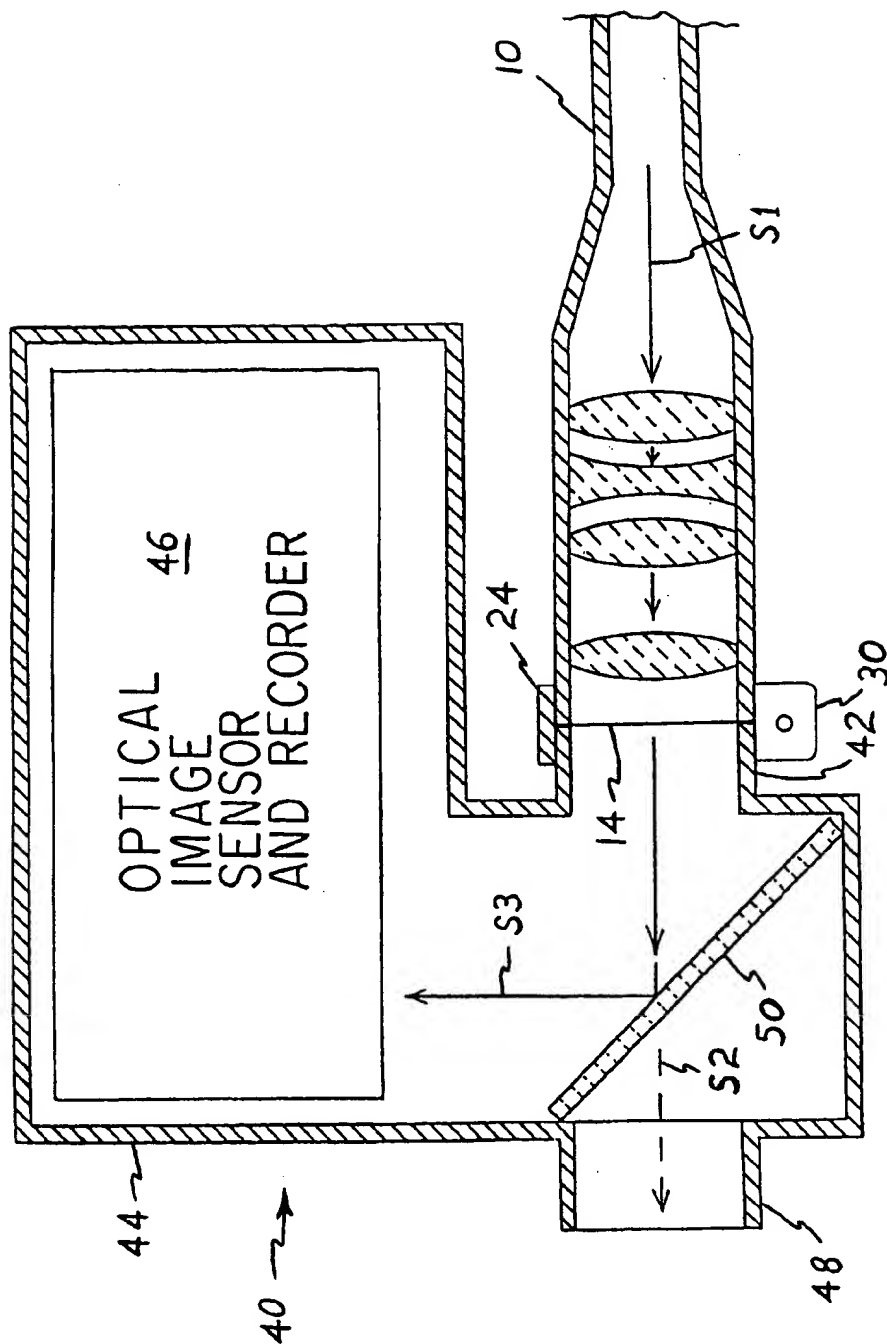


FIG. 3

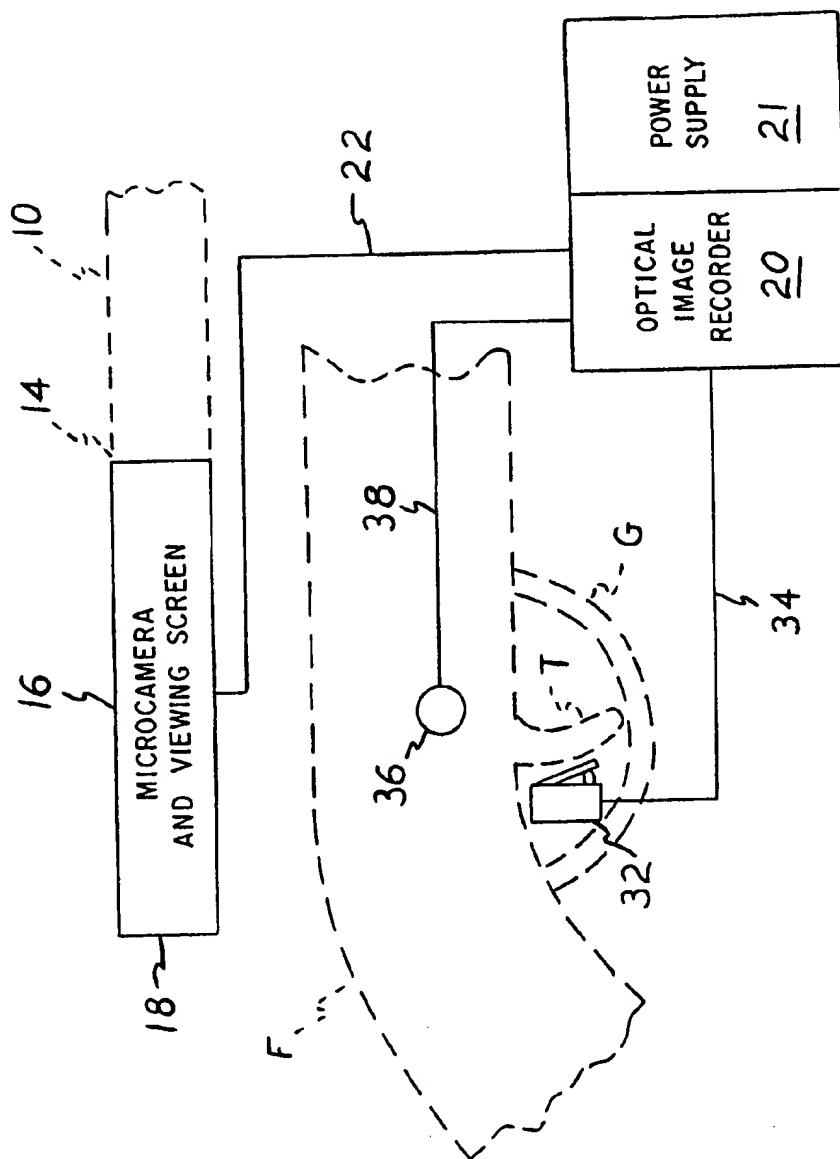


FIG. 4

1

OPTICAL IMAGING DEVICE FOR FIREARM SCOPE ATTACHMENT

CROSS-REFERENCE TO RELATED APPLICATION

This application claims the benefit of U.S. Provisional Patent Application Ser. No. 60/176,026, filed Jan. 14, 2000 now abandoned.

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates generally to optical imaging devices such as digital still cameras and video recording cameras, and more specifically to such a device or system which is attachable to the scope of a hunting rifle or other weapon to record images viewed through the scope. The present optical system enables a hunter or other person to view the image through the scope by means of a partially silvered mirror which reflects the image to the optical recording device, or through the viewing lens of a television video microcamera affixed to the eyepiece of the scope.

2. Description of the Related Art

Over human history, hunting has evolved from a necessary part of life to an enjoyable hobby or pastime for many people. While very few people need to hunt in order to provide food for themselves or family, many hunters still enjoy the challenge of the hunt and the thrill of taking a game animal.

In many cases, a hunter may not wish to kill the game he or she is hunting, but may only wish to have a record of a successful hunt, i.e., a hunt culminating in an encounter with the hunted animal which could have resulted in the taking of the animal had the hunter so desired. In other cases, it may not be legal to kill a given animal due to its status as an endangered species, certain geographical and/or seasonal limits, previously reached bag or quota limits, etc. Nevertheless, the hunter will still enjoy the thrill of the hunt, only to be frustrated that he or she cannot take the animal being hunted.

Even in those instances where a hunter is attempting to take an animal, it can be difficult in the field to confirm the accurate placement of a given shot. While all hunters make every attempt to make a killing shot the first time, this is not always the case due to movement of the animal and/or hunter, deflection of the bullet due to wind, brush, etc., and/or other factors. A wounded game animal must be tracked down and killed, and often the hunter has difficulty determining the exact placement of the shot in order to determine the likely outcome of such a situation for recovering the wounded animal, i.e., making an educated guess as to how far the animal might travel and its likely reactions to the wound.

Also, in many cases a hunter will be certain that the shot was accurate, only to find that the shot went astray or only wounded the animal. With no means of recording the sight picture through the scope, the hunter can never be absolutely sure of the accuracy of a given shot.

Accordingly, a need will be seen for an optical imaging system or device which captures the image viewed through the scope of a rifle or other hunting firearm or weapon, for later viewing. The present invention provides various embodiments of such a device or system, and enables the hunter to view the image provided at the eyepiece of a firearm scope simultaneously with the recording of that image, either by still or motion video recording means. The

2

optical image may be viewed directly by the hunter by means of a partially silvered mirror at the eyepiece of the scope, allowing the hunter to view the image through the scope while still reflecting that image laterally to a camera, or may alternatively be viewed through the display screen of a microcamera placed at the eyepiece of the scope.

A discussion of the related art of which the present inventor is aware, and its differences and distinctions from the present invention, is provided below.

U.S. Pat. No. 4,290,219 issued on Sept. 22, 1981 to Hans Boller et al., titled "Target Sight Recording Apparatus," describes a mechanism for attaching an "instant" camera (e.g., Polaroid, tm) to the eyepiece end of a firearm scope. The optical axis of the camera is offset by about 90 degrees to that of the scope, with a partially silvered mirror or the like reflecting about half of the image of the scope to the camera, with the remaining image being visible through the eyepiece of the scope.

Boller et al. further provide a relatively complex system for recording a series of four images on a single sheet of film. The present device does not use photochemical means for recording the images, but rather uses electronic means and thus is not concerned with the recording of multiple images upon a single sheet of photochemically receptive film. Moreover, the Boller et al. device is devoid of any electronic means of operation, and uses a mechanical linkage between the gun trigger and the camera. In contrast, the present device utilizes completely electronic means for connecting the optical recording means with the trigger of the firearm, and moreover provides a supplemental switch for recording the image visible through the scope when actuating the firearm trigger is not desired.

U.S. Pat. No. 4,835,621 issued on May 30, 1989 to John W. Black, titled "Gun Mounted Video Camera," describes a specially constructed structure for holding a video camera, with a firearm scope mounted to the structure through which the video camera is aimed or sighted. The Black device is not at all a firearm; the gun barrel and action of the device are not operable. Moreover, the barrel is axially offset from the central portion of the structure, where the firearm action would normally be located, unlike the concentric arrangement of components in a conventional firearm. In contrast, the present invention provides means for recording the optical image viewed through the firearm scope of an actual firearm (hunting rifle, etc.). It is also noted that Black provides a view for the operator only by means of an axially offset viewfinder for the video camera, rather than allowing the operator to sight through the scope, as in the present invention.

U.S. Pat. No. 5,287,644 issued on Feb. 22, 1994 to Bruce L. Bolduc, titled "Camera Rifle Organization," describes an apparatus using a rifle-like stock with a vertical camera passage formed therein, for removably holding a conventional camera using photochemical film. As in the apparatus of the '621 U.S. Patent to Black discussed above, the Bolduc apparatus (a) does not use an actual firearm, as does the present invention; (b) uses a mechanical camera actuating system, unlike the electrical actuation used in the present invention; and (c) the simulated firearm structure cannot be used as such when the camera apparatus is removed, whereas the present invention attaches removably to a conventional firearm which may be used as such either with the optical imaging system attached or removed from the firearm.

U.S. Pat. No. 5,711,104 issued on Jan. 27, 1998 to Geoffrey W. Schmitz, titled "Small Arms Visual Aiming

System, A Method for Aiming A Firearm, And Headgear For Use Therewith," describes a system wherein the imaging receiver is attached to and aligned with the firearm axis, as in the present device. However, the visual image is not aligned with the firearm, but is remotely located therefrom in an article of headgear (helmet, etc.) worn by the user of the firearm, unlike the present invention. In this manner, the user of the firearm need not expose his or her head or upper body to align the firearm, but may remain concealed while viewing the image aligned with the firearm. No automatic trigger actuated switch for actuating the video apparatus is provided by Schmitz; the video apparatus must be actuated by a separate switch.

U.S. Pat. No. 5,887,375 issued on Mar. 30, 1999 to Jerry W. Watson, titled "Camera Mount For Firearms," describes a structure for mechanically attaching a video camera to the scope of a hand held firearm. However, Watson (a) does not provide any automated means of actuating the video camera when the firearm trigger is pulled; (b) does not align the video camera with the optical axis of the scope to view the image provided by the scope; and (c) does not provide the same image to the user of the apparatus as that provided at the eyepiece of the scope. The present apparatus responds to each of the above problems by aligning the optical recording device with the eyepiece of the scope, and also providing automatic actuation means for the optical system when the firearm trigger is pulled.

U.S. Pat. No. 5,932,872 issued on Aug. 3, 1999 to Jeffrey H. Price, titled "Autofocus System For Scanning Microscopy Having A Volume Image Formation," describes a camera system in combination with an optical microscope. A dichroic mirror allows passage of predetermined light colors or frequencies to a viewer, while reflecting other frequencies to a camera for recording the image. The camera and microscope of the Price system are integrated with one another; the camera cannot be detached, as in the present system. The Price system is not adaptable to a firearm, nor is any means provided for automatically actuating the camera system when another event (e.g., firing an attached firearm) occurs, as provided by the present optical imaging device with its firearm scope attachment and multiple triggering or actuating means.

U.S. Pat. No. 5,938,717 issued on Aug. 17, 1999 to Jeremy G. Dunne et al., titled "Speed Detection And Image Capture System For Moving Vehicles," describes a laser speed detection system with optical camera. While the Dunne et al. system allows the laser unit to be actuated manually as well as automatically, there is no such provision for operating the optical camera. Rather, the camera may only be actuated automatically when the laser detector triggers operation of the camera. No firearm is provided with the system, for obvious reasons, and correspondingly, no telescopic sight is provided with the Dunne et al. system.

U.S. Pat. No. Des.332,457 issued on Jan. 12, 1993 to Clyde L. Zepp, titled "Camera For Mounting On A Rifle Scope," illustrates a design for a camera body which is mounted in the scope body, in series with the optical lenses of the scope. No means of electronically recording or displaying any images obtained, nor of automatically triggering the operation of the camera by actuation of the firearm, is apparent in the Zepp design.

Finally, British Patent Publication No. 2,248,287 published on Apr. 1, 1992, titled "Sighting Device," describes an alignment system for adjusting the view for the elevation of a gun in a turret, as opposed to the present device for use with hand held firearms. No means for recording images or

scope attachment is provided. Moreover, no trigger system for actuating any form of optical recording device is provided.

None of the above inventions and patents, either singly or in combination, is seen to describe the instant invention as claimed.

SUMMARY OF THE INVENTION

The present invention comprises an optical imaging device for attachment to the magnifying scope sight of a hand held firearm. The present apparatus attaches to the eyepiece of the scope and receives magnified visual images which pass through the scope. The person using the firearm may view the image through the scope attachment, either by means of a half silvered mirror which reflects a portion of the image to an electro-optical recording device (digital camera, video recorder, etc.) or by means of the viewing screen of a video micro camera secured to the eyepiece of the scope. The system is actuated automatically for a predetermined time or number of frames when the trigger of the weapon is pulled, by means of a microswitch positioned behind the trigger. Alternatively, a secondary switch may be provided at some convenient location for the user of the weapon to actuate the optical system without firing the weapon, if so desired.

When the present optical imaging device is properly adjusted with its associated scope and firearm, it provides a hunter with an accurate sight picture of the aiming point of the firearm when the trigger is pulled, thus eliminating much of the guesswork in sighting in a weapon and/or determining the precise placement of a bullet in a hunted animal if the animal is wounded. Images may be viewed essentially immediately after creation by the review and/or playback functions associated with such equipment, with the shooter viewing the images through the eyepiece viewing screen or other viewing means associated with the optical or video recording system.

Accordingly, it is a principal object of the invention to provide an improved optical imaging device for firearm scope attachment, for recording the visual image received by the firearm scope at the time the optical system is actuated.

It is another object of the invention to provide an improved optical imaging device wherein the imaging device and hunter or shooter both receive the same optical image as viewed from the eyepiece of the scope, with the viewing eye of the hunter or shooter being aligned with the optical axis of the scope.

It is a further object of the invention to provide an improved optical imaging device with an optical recording means which may comprise a digital still camera or a video recorder.

An additional object of the invention is to provide an improved optical imaging device which optical recording means may be offset from the optical axis of the scope and receive a reflected video image, or which may comprise a micro camera secured to the eyepiece of the scope and optically aligned therewith.

Still another object of the invention is to provide an improved optical imaging device which may be incorporated integrally with a firearm scope and firearm, as desired.

It is an object of the invention to provide improved elements and arrangements thereof in an apparatus for the purposes described which is inexpensive, dependable and fully effective in accomplishing its intended purposes.

These and other objects of the present invention will become apparent upon review of the following specification and drawings.

5

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an environmental perspective view of the present optical imaging device in use with a firearm mounted scope, showing its general configuration and components.

FIG. 2 is a broken away perspective view of a firearm and scope, illustrating the attachment of a micro camera to the eyepiece of the scope and actuating switch means for the system.

FIG. 3 is a side elevation view in section of the eyepiece end of a firearm scope, the axially offset installation of an optical recording device thereto, and means for passing the optical image to the device and to the viewer.

FIG. 4 is a schematic block diagram showing the major components of one embodiment of the present system and their relationship to one another and to a firearm with which they are installed.

Similar reference characters denote corresponding features consistently throughout the attached drawings.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The present invention comprises various embodiments of an optical imaging device which is removably attachable to the telescopic sight of a hand held firearm. The device permits the hunter or shooter to capture a video image of the game or other target when the weapon is fired, or alternatively to capture an image through the scope without firing the weapon, if so desired.

FIG. 1 provides an illustration of the general concept of the present invention, in which a hunter H is preparing to fire a rifle or firearm F at a deer or game animal A. The firearm F is equipped with a telescopic sight or scope 10, with the scope 10 having a forward or objective end 12 and an opposite rearward or eyepiece end 14. The scope 10 shown in FIG. 1 is equipped with electronic optical imaging and receiving means comprising a miniature video camera or minicam 16, concentrically aligned with and removably secured to the eyepiece end 14 thereof. Such micro cameras 16 are conventional, and thus no detailed description of such an instrument need be provided here. It is well known that such micro cameras 16 receive an optical or video image and may provide a view of that image by means of a rearwardly disposed screen 18 at their viewing end, while transmitting the image to a recording means 20 via a cable 22 or other means (radio frequency or RF transmission, etc.).

FIG. 2 provides a more detailed illustration of the apparatus shown generally in FIG. 1. In FIG. 2, the micro camera or minicam 16 is removably secured to the eyepiece end 14 of the scope 10 by means of an encircling clamp 24, which secures about the eyepiece end 14 of the scope 10 and the forward or objective end 26 of the micro camera 16. The clamp 24 may be a padded clamp, known in the trade as an Adel clamp, or other clamp means (e.g., worm gear type hose clamp, etc.) as desired. A removable or adjustable screw 28 may be provided with an Adel type clamp 24 to secure the two extended flanges 30 together.

FIG. 2 also discloses two different actuating means for operating the minicam 16 and recording means 20 of the present invention. The first actuating means provides for automatic operation of the camera 16 and recorder 20, by means of an electrical microswitch 32 positioned within the trigger guard G of the firearm F, immediately behind the trigger T. When the trigger T is pulled to fire the firearm F, the trigger T moves rearwardly to contact the microswitch 32, thereby closing its contacts to actuate the micro camera

6

16, and thus the recording means 20, via a cable 34 extending between the microswitch 32 and the microcam 16 and/or the video recording means 20. The system may be adjusted to actuate the camera 16 and recording means 20 just before the trigger T releases the firing pin to fire the weapon, and may include timer means (not shown), which may be adjusted to run for a few seconds thereafter as desired to capture the firing of the firearm F and the strike of the projectile on the target.

At times, it may not be desirable to fire the firearm F, even when the weapon is loaded and ready to fire. Accordingly, the present invention includes a supplemental electrical switch 36 remotely disposed from the trigger T and guard G, which may be actuated by thumb or finger contact as desired. The hunter H or person using the firearm F need only extend his or her thumb or finger upwardly and clear of the trigger guard G to close the contacts of a pushbutton or other switch 36 independently of the operation of the trigger T, actuating the camera 16 and recording means 20 by means of a supplemental cable 38.

FIG. 3 provides a schematic side elevation view in section of an alternative means of carrying out the present invention, in which the electronic optical image sensing and recording means is contained within a housing 40. The housing 40 is in turn temporarily and removably secured to the eyepiece end 14 of the scope 10, e.g. by means of an Adel clamp 24 as used for securing the micro camera 16 to the scope 10 in FIG. 2, or other suitable means as desired. The clamp 24 secures about the eyepiece end 14 of the scope 10 and about the scope eyepiece attachment portion 42 of the housing 40, thus securing the attachment portion 42 of the housing 40 concentrically to the scope 10 as shown in FIG. 3.

The housing 40 further includes a camera holder portion 44, which is radially offset from the optical line of sight S1 of the scope 10. The camera holder portion 44 is sufficiently large as to hold any practicable electronic optical image sensing and recording means 46 as desired, such as a conventional digital still camera capable of capturing from one to a few frames when actuated, or a conventional videotape recording device which may run for one or more seconds to capture the image viewed through the scope 10. It will be seen that the device of FIG. 3 provides for the entire apparatus to be self contained, with no external recording means and power supply, such as the belt attached recording means 20 illustrated in FIG. 1 of the drawings, being required with the apparatus of FIG. 3.

The scope eyepiece attachment portion 42 of the housing 40 includes a rearwardly disposed viewing port or eyepiece 48 opposite thereto, enabling the hunter H or shooter to view the optical image along the line of sight S2 from the scope 10. A half silvered mirror 50 is disposed within the eyepiece attachment portion 42 of the housing 40 between the forward scope attachment end and the rearward eyepiece end 48 at a forty five degree angle to the line of sight S1 of the image passing through the scope 10, and passes a portion of the image passing through the scope 10 along the line of sight S1, through the mirror 50 to the viewing port or eyepiece 48 via the concentric line of sight S2. The remainder of the image is reflected radially outwardly from the line of sight S1 to the optical image sensing and recording means 46 contained within the camera holder portion 44 of the housing 40, and is optically aligned with the mirror 50 along the radial line of sight S3. The mechanism may be actuated by the means illustrated in FIG. 2 of the drawings and discussed further above.

FIG. 4 provides a schematic illustration of the arrangement of the miniature camera 16 and remotely located

7

optical image recording means 20 and associated electrical power supply 21, along with the actuating switches (trigger switch 32 and supplemental switch 36). The two switches 32 and 36 and microcamera 16 communicate with the recording means 20 as indicated by the cable or other means 22, 34, and 38, and may either be hard wired to the recording means 20 or communicate therewith by radio frequency (rf) signals, as is known in the art.

In summary, the present invention provides various embodiments and means for interfacing optical imaging and recording means with the telescopic sight of a firearm. While the removable nature of the various components from the scope and firearm has been noted in the present disclosure, it will be noted that the present invention also lends itself to permanent installation with the scope, essentially as shown in FIG. 1 of the drawings. The separate components, such as the video recorder apparatus and its power supply, may be linked to the video camera of the scope by removably attachable cables, as shown, or by RF links, as desired. The use of a conventional miniature camera also provides further benefits, in that such a camera may be installed directly to the back of the scope and may preclude any requirement for corrective lenses or the like for hunters or shooters who might otherwise require such. Accordingly, the benefits of the present invention extend far beyond the capturing of an image of a game animal during a hunt, to assisting the shooter in sighting in a weapon and scope, and other benefits as well. The present invention in its various embodiments will prove to be a popular accessory with most hunters and shooters who have occasion to use scope equipped firearms.

It is to be understood that the present invention is not limited to the embodiments described above, but encompasses any and all embodiments within the scope of the following claims.

I claim:

1. An optical imaging device in combination with a hand held trigger actuated firearm having a magnifying scope sight with an eyepiece, comprising:

a hand held trigger actuated firearm;

a magnifying scope sight with an eyepiece attached to said firearm;

electronic optical imaging and recording means communicating with the eyepiece of the scope, and receiving a visual image therefrom;

said electronic optical imaging and recording means further including means aligned concentrically with the eyepiece of the scope for providing a visual image therefrom to a user of the firearm; and

actuation means for automatically operating said electronic optical imaging and recording means;

wherein said actuation means is selected from the group of a microswitch disposed behind the trigger of the

8

firearm and a supplemental electrical switch remotely located from the trigger of the firearm.

2. The optical imaging device according to claim 1, further including means for removably attaching said electronic optical imaging and recording means to the scope of the firearm.

3. The optical imaging device according to claim 1, wherein said electronic optical imaging and recording means further comprises:

a housing including a scope eyepiece attachment portion for securing concentrically to the eyepiece of the scope, and a camera holder portion radially offset from said scope eyepiece attachment portion;

wherein said means for providing a visual image is a rearwardly disposed viewing port formed within said scope eyepiece attachment portion of said housing;

a half silvered mirror disposed within said scope eyepiece attachment portion of said housing and positioned behind the eyepiece of the scope and in front of said viewing port, for transmitting a portion of the light from the scope to said camera holder portion of said housing and further passing a portion of the light therethrough to said viewing port; and

an electronic optical recording device disposed within said camera holder portion of said housing, and optically aligned with said half silvered mirror for receiving and recording an optical image reflected therefrom.

4. The optical imaging device according to claim 3, wherein said electronic optical recording device is selected from the group consisting of digital still cameras and videotape recording devices.

5. The optical imaging device according to claim 1, wherein said electronic optical imaging and recording means further comprises:

an electronic optical image receiving device disposed concentrically with the eyepiece of the scope, for receiving an optical image therefrom;

wherein said means for providing a visual image is a viewing screen rearwardly disposed with said electronic optical image receiving device, for viewing the optical image passing through the eyepiece of the scope; and

an electronic optical recording device remotely disposed from said electronic optical image receiving device and communicating therewith.

6. The optical imaging device according to claim 5, wherein said electronic optical image receiving device further comprises a micro camera.

* * * * *